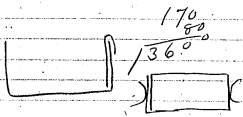
Notebook, N-05-11-25

The only dated entry in this notebook is from November 1905. All entries are by Edison. Included is a list of things to do regarding the preparation of a "new model battery" using cobalt flake and a tube-based, rather than pocket-based, design. There is also a set of descriptions of nickel and cobalt ore sources. Near the end of the book is a series of phrases that may represent ideas for an advertising campaign for the phonograph. The front cover is labeled "New flake Co Tubes— Record." The pages are unnumbered. Approximately 30 pages have been used.



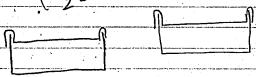
170
200
340 watts.

270
61

2700
2440
2600

44

100
44
56



25

470) 746 (1587
470
2750
2350
4160
3400

362
130
1086
362
47016

1.587
16
9522
1587
25.392

362 - 446) 1310 (3. lb -
338

16 lb

12.5
30
15

3.200) 800.00 (250 mapergm.
64
1600
1600

1250
288
10200
10200
2500
362200

5

250
5
1250
288
10000
10000
1550
1250
2850

288
18
2304
288
5184

144

50
3.2
1.8

4

151.2

55 —

144
55
720
720
7920

792
518
1310

3|567
189
756
492
151
2
145
6804
56
15
2
145

Nov 25 1905

New set of experiments as final round up of new model battery with tubes and Cobalt flake

1 – Fuse 3 neg Tubes [that were down to 600 in a good group] of KOH. Then dip + dry twice or 3 times in Conc NH_4 + Carb NH_4 of Nickel hydroxide, dry + put on hot test to see if $Ni(OH)_2$ has shrunk –

2 Take some of the good large sheet Cobalt films make 6 cells 3 to 6 run hot 3 cold use Ni strips, fred Ott to make –

3. Same as 2 but run cold continuously anode in KOH made in different ways.
(1a) Electrolytically – from Sulphate also from Sulphate by $BaCarb$ etc – also Electrolytic $NaOH$, + from Sulphate + $BaCo_3$

4 Doctor to analyze our KOH. test
Especially for Arsenic, KCy - I - Al

√5. Test now [that have been run with tubes having Co flake] for Cobalt,

6. Try hot test 3 cells with sheet Co
in KOH having 25 mlg KCy to cell.

7 = Make 15 flat cups filled with Co flake
made with Copper on big drum &
punched, 3 to be anode continuously
cold 3 continuously Hot, 3 charge-discharge
3 continuously reversed hot the last
with irons,

8 - When get new flake make set 5 with
50 increments a dab of green then Tamp
then dab flake then Tamp & so on
also with 75 increments

9 = Make group 5 tubes using same proportion glucose as in No 2 + 3.
Idea being minimum binder, ~~Fro~~

10 - Make group of 5 with rings soak out 3 days minimum heat in faint alkaline water then soak 75 hours 33% KOH before charging

11 Put in glass cells 2 of each of following good Co sheet flake KOH, Containing in each 100 cc 50 mlg KCl — $KClO_3$ — ~~Ⅱ~~ KI. SbS, Sb_2O_5 of IK — KS
Continuously use as anode - do this — Chem Room — Clean out the glass cases Prof O.C. to do it -

12 Split 3 of group which have long but second 1 of which is good — note flake etc — dissolve by KCy all — note flake by weight from all 3 —

13- see if Nickel Nitrate comes to a group is sticky Enough to stick flake Co To Ni RHh

14= Cut Composite Cu Co. into strips 1/32 X 1/8 inches square mix with Molasses

15 Plate strips 1/2 of thousandth Cobalt, for tests also with Nickel to see which best,

16= Use platinum dish & electrolize our Reg RHh, & have the Doctor assay the deposit qualitively on both Anode & Cathode,

17= Test Co plate in large sheet before & after Hydrogen & see which lasts longest in RHh, 1/2 amp To inch -

18 Doctor to assay our Iron, Ni, & RHh,

19= Pack tubes with round convex plunger also Concave - also close fitting flat plunger + 2 or 3 orgs smaller diameter -

20 - Use tube nickel plated, also Cobalt plated

21= Try 5 good new tubes with none that have been previously used + that have probably been fired from detonators dubolimeds -

22 Initial charge 5 cells say 10 hours rest 12 hours charge again 10 hours 1/2 density - do this twice The idea is to build up MO_2 to maximum before discharg so there may be mechanical cracking off the green otherwise + total separation + out of Contact,

23= Do the above also in 33% NaOH + finally soak out a week in KOH before Use.

24 - If it takes a week for green to develop maximum capacity - try 5 tubes soaked week in 27% KOH, before changing

25 See if running of tubes is hurt by acetone, this dissolves HgO - & if it hurts tubes see if the Iron or Ni

26 - Test with new Copper Hg Iron to make sure Copper does not affect the Cobalt flake -

27 - Corrugate 5 good tubes to make sure this is not necessary

28 Run 3 tubes with Reg graphite mix Cobalt & find out why they don't give capacity they should - probably by the expert Can find out nature of trouble with Co flake tubes -

29 = Make tubes green all Through
15 20 30 + 40 mesh — with flake
thru 20 mesh —

30 - Try some thin Cobalt sheet flake in
KOH, in which there is an agent which
dissolves Hg - Acetone etc, see if
life of flake is shortened,

31 = As all the 3 tubes of a group on
starting Cold + for many runs after one
all good + up to capacity even up to
150 runs in fact improve, and even on
50 additional hot runs are good &
then go bad or one goes bad on the
next run of 50 hot, shows that the
Contacts of flake of cold run is good,
+ will keep good that the loss of
capacity is due to the effects of
heat and that with same tubes
made alike same flake etc the effect
of heat is different + places the
trouble either to separation of tubes
or to the effect of heat on some
dissolving ingredient which effects
the flake + the chances are that

31. The trouble is due to something in the KOH, in the rubber or most likely in the iron — or iron itself, which solubility depends on impurities in the KOH. As graphite pockets of a group contain such great variation as to flake - but all go bad together & Ni is more so good as Cobalt. That it is something which affects the flake & varies in the different cells. ~~[illegible]~~. Could be Silica in KOH causing dissolving of the iron, or flake, Aluminium, Hg - Organic matter, Acid radicals - Cu, Pb etc reduced by H2O, NH3 Oxides from rubber impurities, Manganese rather likely in the iron possibly the whole trouble is due to oxidation of the flake, the one of the group that goes bad so that the tube swelling allows the diffused permit more electrolyte to reach the flake between tube & mix & thus oxidizes the important flake which remains Contact with mix & tube -

32 = Makesome Ni Cu flake, perhaps reason Ni works bad, there is Zinc in it =

33 Try Bromine in $CoCl_2$ bath for plating also in Cu bath, in place Chlorine, - in Case can't get chemicals free of iron etc —

34 It now seems probable that the reason Nos 2 3 4 etc 30 31 He have given more permanent results on hot test Especially No 3 is that it was Cobalt + the flake was made with a single plating + was thick also well covered — The flake produced by one plating on Zinc must have been far tougher + more difficult to attack that that ~~Tube~~ original got by Warren on the Beryllium that being far more porous Eaten by acids + full of Zinc + thinner

35 All new test cells to be soaked in Nickel plated cells not glass with only few drops KOH to get rid of silica getting under tubes & Chromium on the flake & pocket which it dissolves within the pockets soaked long time had in 33 or 34 plate,

36 = Get good supply of ~~[illegible]~~ Hank Or test test for acid etc & wash organic matter,

37 = Previous to use wet the green & let it remain wet for 2 or 3 days, or perhaps what is better spread out a flat under bell jar would it until it takes up maximum H2O – The make a mix & group –

38 - Same as above but soaked in water 2 days –

39 = It may be that the time between the mixing & putting in tubes + exposure to air during the glycerine or its absorption by the grain before Tamping profoundly affects its lubricating qualities + explains changes between groups made apparently the same —

40 = 1 group colored be given a varying charge, charging 12 off 12 hours than on 12 + so on the buildup the given to a Conductor = The next Gang to reason be the KOff lost by Charging

41 - Don't forget pack group with rings made slightly larger + put on load after packing to allow Mat to Expand —

42 = Top some thro 15 all fines in
also thro 15 on 80 —

43 = Mountain green with some Ammonia with
sulphuric in to make it blue then coat with
Recovered graphite & made it just like
green with Cobalt of Calc — thro 40 all
fine in —

44 = perhaps pkg by machines make
a big rind of and thro perforations
& separates of blows flake, whereas
hand pkg cut — Hand pack &
machine pack a single mix 3 in
inch group —

45 as No 2 3 4 etc tubes ~~were~~ had
flake made by single layer
upto 35 or thereabout & all after
were several layers of Zn Co,
possibly flake free Zinc or less
homogeneous — New flake ought
to be good as slow good like 2 + 3
+ 4 Ni —

46 = ~~[illegible]~~ group thoroughly soaked water (18) green – then used Kerosene or foam finder – This prevents bubbles going in green – dissolves out by Benzol etc [illegible] then alcohol hot ~~[illegible]~~ !

47 = Moulder green with KCl_3 to make strictly by dissolving detum + use flocks,

48 = After group made dry in KCl_3 dry + put soak in 2(%) to soak hot KCl_3.

49 = add to glucose some KCl_3 to act as a solvent of green surface

50 Paint chemicals on air now – test Hg – KOH – bad rubber mail [illegible]

51 = ~~Take~~ group same my
one group Nickel plated pkt.
one Cobalt plated one
Nickel plated over this Cobalt,

52 = Try some 1/8th of 1/100 also
1/4 of 1/100 Co flake - using
842 743 -

53 = Take dissolved Cobalt flake
tube break open KOH modelly
open up + dissolve out
green by KCy a sec amount +
Condition of flake -

54 group 3 each assume in 250 mlg
each cell - of following - Nitrate K
Sulfate K Chloride K Sulphur
100 mlg KCy - Sulfide K -
100 mlg Silica - 100 mlg Alumina -
250 mlg Lime - Barium 50 mlg KI
Manganate K - gelatin,
Hydrocarb, Arsenite, Antimony
OVER.

Iodamm K Borate K – Phos K.
Bromide K – ZincOx – LeadOx –
Copper(OH)$_2$ Ammon KOH, HgCy – KCy
NaCy – KChlorate Nitrite K –

55 = by removing wire from Z tubes +
replacing w/ good Co plated tubes
possibly also something

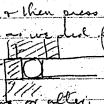
56 – Fred Oth says plating of Cobalt
was better 6 at on tubes in many
cases & thus ended through the curve
non chemists to get + from an insoluble
hydroxide + thus dead on Cathode
possibly thus would explain
all the variations w/ cells
as they don't appear at 195 –

57. It looks as if I have been on the wrong ~~tr~~ track with tubes – while it is very well to pack light sideway, it is more essential to pack light endway, witness the long life of all high corrugating pressure flat plates I have made flat packed with Reg mix grafite – 250 always – they are about as good after 50 hot runs as ~~bef~~ when blanked. Heavy pressure against packed has always been good –

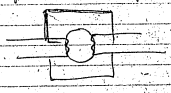
In pkg tubes should use a convex packer

or pack regular – then press or roller Corrugate same as we did first

or press square



spit rings on before or after.



58 = Notice if any of the old Computed tubes have opened –

59 = plate pockets with Co alone – Nickel Co – Co 60 Ni 4 – Ni alone –

60 = make plates with Nickel flake alone – ditto 60 Co 40 Ni –

61 – Make some oval tubes (2) oval some round tubes + rings put in oval die + pack with oval plungers + let them swell round –

62 Order from Synopy Glucose also some more (2) 50 lb Glucose

63 Cooking to make some Cobalt anode by plating in presence of long Chlorine – also Copper in presence Chlorine + very low density + fairly strong acid – then with these anodes + good Sol my flake equipt in mill drum without + then with Chlorine

64 = The reason you won't work in tubes is that the mix shrinks, bad - try a group of 3 charge & discharge them & then compute to press them together

65 = Because try groups after they have soaked in KOH, 21% 24 hours (10) don't change before to allow them to get fully soaked with KOH, remember the old expression, of great length time it took to get a colored chemical out - but have some soak 48 hours & some on 3 or 4 hours -
Say of same mix - 3 soaked
5 hours 3 12 hours 3
24 hours 3 48 hours +
3 96 hours before charging
15 all together -
Empty KOH from all before charging - put in fresh ~~and~~ after charging ~~& [illegible]~~ & slowly till reach maximum
Empty out KOH, & put in fresh put in KOH test

66 = Make another Loader & learn one of the 60 go under Fred Ott,

67 Group green hat s my 220 for 3 or 4 hours against a group that had absorbed Mag water under bell jar in hot place —

68 – Mix 108 green
37 Cobalt flake
30 glucose or less –
This makes 5 groups of 3 each, although it should make 8 groups possibly on account of thickness of flake needs 7 to 3 flake.
Then it mixed 62 108 green
46 Co
30 glucose –

10^{4}
3^{7}
4^{0}
(97^{0})
1^{55}
2^{30}
2^{30}
2^{35}
7^{5}

69 = Feby 23 Entered into run book Tilghman K 250 milg with Ni plated

also gramp with Co & Ni tubes
with 250 milg gelatin — ditto
Cellulose — ditto Oleic acid —
ditto K_2S — Iodide K —
KCl = Sulphate K —
Nitrate K,
Ammonia 1 gm —
gramp. 10% K_2CO_3 10% KOH —

gramp 15% KOH — Ni tubes also Co tubes
gramp. 38% " " "

~~gramp~~

gramp with 4+3 Latten graphite
used just as use flake Co —
Ni & Co tubes —
gramp 250 milg Hg dio in soulthy —
" 250 " Acetone,
" Phosphate Potash, Ni & Co
" Borate " Ni & Co

New South Wales – There is a smelting works at Dapto –
The New Caledonia Coms controlled Nickel mines are to send over their ores have it treated there, see of near Port Macquarie

Deposit of Ni + Co on Lehigh Co Idaho 60 tons shipped as samples therefrom in 1905 nothing ever given it means of obtaining Co which is the Salmon City mine –

Geological Survey US say assay of Slumbered Con Mine in Grant Co Oregon

Si	47.81	CO_2	1.94
S	4.43	Cobalt	6.34
As	20.18	Ni	0.75
Fe_2O_3	17.28	gold	0.017
Al_2O_3	0.12		
CaO	2.88	ag –	0.0028

Some nickel ores from development work on mines in Hemlock Floyd Co Virginia & also near Webster Jackson Co NC.

US Arsenic Mines now wkg Rewald Postoffice Floyd Co Virginia

Write Chief Static Bureau of Mines Denver Colorado if they know anything about Sterling Mining Co Mines Gunnison Co if operated or abandoned

ditto to Utah if he knows of any smelting or producing Mr Butte or Spring centering Cobalt

Manganese ores occur in Bibb Co near Woodstock Ala in iron mines at Stocks mills Cherokee Co Ala -

North Carolina Madison Co near Warm springs -

Arrange to have shipped at
Cost + 20% added ~~500~~
Enough Old Reg mix for 50
Cells daily for next six weeks
& Chemical 100 daily —
Use 10% Hg in Prin —

Order 300 Ton Hydraulic for
Glen Ridge

Order from Bergmann acetylene
Wrecker for 200 cars daily
for Glen Ridge also one
set his new Iron fillers
4½ gram Cake

Furnish Bergman drawings
for filler tube drawer, Electrodes
rings & grid —

Order big Copper drums

design soaking tanks for
flatten RLY also others

John design a good Slicer
also Chopper for big
bldg —

Test little Roaster to make
pyrite magnetic leach
from ott —

Wiley from Cement come to
Orange see Drs Michaud
fumbling unembumed Silica

Put Sands & N J Pat Co
with Carts in my home in
Sofa —

Arrange with Bergmann
get him Cup & Cock of it
cheaper —

John Ott about testing
Chaum now used & making
other Chaums test
against it —

Weber about closing 15 ft
back ends bldg & steam
heat etc so can occupy

Hazel prelim sec of RCy allotted
land with view of using it
for soaking tanks for flake
also Hard Rubber lined

Bergmann about Can
Tools for bending & Corrugating
Rolls

My first appearance.
To " "

Not such a bad world to live in after all.

They saved up a little money.

Their own theatre,

The Triumph of Machinery

Thats last and best investment

Whats the use of living if you
dont get one of these,
(you cant have one)
~~Just as necessary as food~~

The ~~Sound~~ Voice heard round the world,

Sounds from distant lands

Home is not so lonely

~~[illegible]~~
~~[illegible]~~

Better than Money

Just received from the City

~~Their~~ Their first record,

Just what was needed in the home.

Home Theaticals

Thou art so far yet so near

An addition to the home – fireside

They aint worrying

~~We are not going~~

They won't worry any more

The last bit of furniture,

Be it ever so lowly there is no place like home

The Opening of a new world to them

500
30
530.00
75

108
30
37 Cabinet
175

The real thing

Getting what they paid for –
" " wanted – needed.

~~for the~~
Just received from their son in the City

"Appreciative" Appreciation,
and appreciative audiences

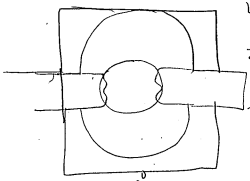
They're are satisfied

They won't get tired of this machine

~~Happy~~ "Machine happy"

Happiness by Machinery

The poor mans home is now a little brighter.



4920 mlg
17
3444
4920
83640

17/1000 of 1%

446 20 / 1000 / 4920
8500
4920

7/175
25

100

108
30 glue
38 Co
175/380(2.6
348
320
176
144

18
6
108

108

18
5
6
29/60(206
58
20
174

108
30
37
175/370(2.1
350
200
18
5
6
29

25

29/50(1.72
29
210
203
30
29

Cobalt 21%
gluem 17%

21
17
62
100

108
46
154/460(3
462

7/109 29/180(62
15.43
3
4629
174
68